REPORT

ON THE PREVALENCE OF

PHTHISIS IN VICTORIA.

[Adopted at a Special Meeting of the Medical Society of Victoria, December 19, 1877.]

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At a meeting of the Medical Society of Victoria, held on the 3rd day of October, 1877, it was resolved, "That a committee, consisting of Dr. Singleton, Dr. Williams, Mr. Girdlestone, and Dr. Jamieson, be and is hereby appointed to consider and report upon the whole subject of Phthisis in Victoria."

In accordance with that resolution, the following report is now presented, in which evidence is adduced bearing on the question of the prevalence of phthisis, a point with reference to which contradictory statements have recently been published.

It is doubtful whether there exist at present statistical data sufficient for the final settlement of this question in its different bearings; but an endeavour has been made to collect the evidence so far as it is accessible, and to present it in such a form as to allow of the conclusions herein adopted being easily tested.

It has been considered advisable to discuss separately these two points: I. The comparative prevalence of phthisis in England and Victoria. II. The comparative prevalence of phthisis in Victoria at different periods, for the purpose of showing in how far the disease has increased or diminished.

To facilitate the discussion a number of tables have been compiled from the official returns, which are appended to this report, and which are referred to throughout. The committee have to acknowlege the courtesy of Mr. Hayter, the Government statist, in supplying the materials from which some of these tables have been constructed.

I. It is not disputed that the rate of mortality from phthisis is considerably lower in Victoria than in England. Table I. shows that, whilst in England and Wales the rate of mortality from phthisis per 10,000 persons living averaged 25·66 in the five years 1860-64, and 22·83 in the five years 1870 to 1874; in Victoria, it was only 13·08 and 12·60 for the same periods. Many circumstances no doubt have helped to bring about this low rate of mortality in Victoria. Thus, the population is comparatively small, and fewer persons are engaged in unhealthy occupations than is the case in England; even in the poorest classes too, almost none need want for abundant and nutritious food. In how far the climate of Victoria is such as to contribute, along with these and other circumstances, to the reduction of the phthisis mortality is a much-disputed point. It is certain that many phthisical persons claim to have received benefit from a residence in this country. In an indirect way, also, it may be shown that the climate has something to do with it. The inflammatory affections of the lungs are undoubtedly

often caused by certain climatic conditions, and especially by a low average temperature, accompanied by dampness of air and soil. It is now recognised that most cases of phthisis represent really the final stage of some acute inflammatory affection, generally pneumonia, and it is therefore to be expected that where these inflammatory affections are common, phthisis will be prevalent in some direct proportion. The class of diseases of the respiratory system (which does not include phthisis) contains a larger proportion of deaths in England than in Victoria, as appears from Table I., which shows that the rate of mortality, per 10,000 persons living, in England averages about 35, whilst in Victoria it averages little more than 15. It is therefore safe to assume that the low rate of mortality from phthisis in this country is due in part to the comparative infrequency of the diseases of the respiratory system, that again being due to favourable climatic conditions.

It has been supposed, and is said indeed, in the *Victorian Year Books* for 1875 and 1876, that a fairer comparison would be between all England and the district including Melbourne and its suburbs. This is argued mainly on the ground that the density of population would be more nearly equal. Too much stress is here laid on mere density of population as determining the amount of phthisis in any district. This can easily be shown, from the mortality from this cause in the different registration districts of England and Wales, where the rate does not vary in any direct way with the varying density of population. The following table, giving the number of persons to a given area, and the phthisis mortality per 10,000 persons living in 1875, in the least and most densely populated districts, brings this out very clearly by showing an extreme case.

	N. Wales.	Lancashire.	London.
Population to 100 acres -	22·7	231·7	4571·5
Phthisis rate - -	27·5	26·8	26·6

Of course other districts in England, more densely populated than N. Wales, have a lower mortality; but it is a fair inference that density of population need not by itself count for very much, compared with all the other conditions, in determining the number of deaths from consumption.

It is true that the rate of mortality from phthisis is about the same in Melbourne and its suburbs as in England; but the conditions in the two cases are not fairly comparable. It is certain that a considerable number of phthisical persons are constantly leaving England to die or to reside abroad. The effect must be to reduce the rate of mortality to some extent. On the other hand, Melbourne is the great centre for medical and other charities in the colony, and therefore persons suffering from phthisis, as from other diseases, come to Melbourne, and in many cases die there. In

addition to this influx from the country districts, consumptive cases come from other countries, the total effect being to raise the rate of mortality to a considerable extent. That these and other circumstances tend to raise unduly the Melbourne death-rate is evident, and the following comparison shows that the rate really is disproportionately high. In 1875, the phthisis mortality per 10,000 persons living was as follows :—

London.	England.	Melbourne.	All Victoria.
26.6	22.24	21.46	12.60

It is clear that exceptional circumstances must be at work in making the difference between Melbourne and all Victoria so great when compared with that between London and all England. This is even more clearly brought out by Table VII., which compares the phthisis mortality of Melbourne with that of the rest of the colony, the latter being rather less than one-third of the former in 1871, and considerably less than half in 1861. Probably enough the utter want of anything better than surface drainage in Melbourne has a considerable share in keeping the rate of mortality at such an absurdly high figure. If the exceptional circumstances which operate so unfavourably were absent, the average of the whole colony would be much lower, and would compare even more advantageously with that of England, as given in detail in Table III., where the superiority of the Victorian rate, especially at ages under 20 years, is very marked.

II. The question as to increase or diminution in the mortality from phthisis in Victoria of late years is more difficult of settlement. Sufficient time has not elapsed to allow of a proper comparison, the composition of the population as regards the proportions of persons living at different ages having been constantly undergoing changes. Even with the data at our disposal, however, it is possible to obtain some useful results; and other points, which must for the present remain uncertain, will perhaps be cleared up after the next census returns are published. Before entering on a comparison of the mortality in different years, as given in considerable detail in the tables appended to this report, it is necessary to refer to a view of the question given in the *Victorian Year Book* for 1873, where it is settled in a somewhat summary way. It is said there (page 95), "It must be remembered, however, that the population at the ages most subject to phthisis has decreased during the period (1864-73), and therefore the complaint is really more fatal now in Victoria than it was some years ago." In the *Year Book* for 1875 (page 135), this assertion is somewhat modified. "If it be true that the population at phthisical ages is decreasing, as there is reason to believe, it follows that since the death-rate from phthisis remains unchanged, the disease in a fatal form must be increasing." The opinion thus

stated is based on the fact that between the censuses of 1861 and 1871 the male population between 20 and 35 years of age decreased by 48,766, and the female population between 25 and 30 by 1,394, with the assumption that the rate of mortality is so much higher at these than at other ages, that a corresponding increase in the number of persons living at the more advanced ages will not compensate for this diminution by still equalising the rate. This assumption is not borne out by our tables. Table III. shows the rate of mortality from phthisis at different ages in England and Victoria, with the result that between 35 and 45, the rate of mortality is not at all lower than between 25 and 35 in Victoria; and that even up to 55 it is greatly higher in both countries than it is between 20 and 25. Now, between 1861 and 1871 the number of persons between 35 and 45 increased by 38,535, and between 45 and 55 by 27,739. The assumption being shown not to hold good, it follows that the argument itself falls to the ground; and it is not allowable therefore to assume that the mortality from phthisis has virtually increased, merely because the population contains relatively fewer persons between 20 and 35 years of age. Of course it is true that in 1871 there was a larger proportion of children in the population than in 1861, and it is difficult to balance the effect of that against the increase at the advanced ages; but for the present it must be enough to point out that, according to Tables I. and IV., the average rate for all ages has been perceptibly lower of late years than it was ten years previously.

After having considered this preliminary and more general view of the question, we are in a position to go into a more detailed comparison; and for this purpose it is necessary to take the census years 1861 and 1871, as it is only in them that we have exact details of the numbers living at different ages.

Table III. gives the rate of mortality at different ages, arranged in periods of five years up to 25, and of ten years to 55, following the arrangement adopted in the English returns. Above 55 the numbers are so small that anything like a fair or uniform average can be got only by taking them all together, and this has been done. It appears then from Table III. that at all ages under 15 the rate of mortality from phthisis was very much lower in 1871 than in 1861, less than a fourth between 10 and 15, and about a half and a third at the ages under 5 and between 5 and 10 respectively. Such a uniform result, and such a marked difference, cannot be explained as a mere accident. Between 15 and 20 and at all ages above 35 the advantage is also decidedly in favour of 1871. On the other hand, between 20 and 25, and to a smaller extent between 25 and 35, the rate was lower in 1861. It is therefore a circumstance requiring explanation that whilst at all other ages the conditions, as a whole, were more favourable in 1871 than in 1861 to all under 20 and above 35 years of age, the opposite was the case with those between 20 and 35. The mere statement of the case implies that some disturbing cause must have been in operation, which affected mainly these latter classes.

The explanation of the anomaly is to be found, if at all, in the circumstance that the persons who come to this country, already suffering from phthisis, are the young adults, and especially young men who have not formed ties of family or business, and so can easily travel alone in search of health. This is brought out in a table in the *Victorian Year Book* for 1876 (page 75), where it is shown that of 49 persons (40 males and 9 females) dying of phthisis in Victoria within two years (31 of them within one year), after their arrival in the Australian colonies, 42 were between 15 and 35 years of age, with the probability that they were almost all above 20. We have not the means of determining the figures for the year 1871, but as the merits of the Australian climate were at that time strongly upheld, and had scarcely been at all controverted, as has more recently been the case, the likelihood is, that in 1871 even more phthisical persons arrived than in 1876, with the effect of disturbing to a considerable extent the normal rate of mortality among persons belonging to the classes between 20 and 35 years of age. Such an influx of persons in an advanced stage of consumption would not occur in 1861, when the advantages of Australia as a health-resort had not received much attention. In this we have a feasible explanation of what would otherwise be an inexplicable anomaly.

The very marked difference in the rate of mortality in 1861 and 1871 among children, and young persons under 20 years of age, is of great importance. These classes of the population are not subject to irregularities to any considerable extent, there having been a steady increase in their numbers with the increase of the population. The great and uniform reduction in the mortality from phthisis in children under 15 years seems to be capable of only one explanation, viz., that, however produced, there was less liability to the disease at the second decennial period, and that since the persons under 15 had come to consist more exclusively of those born in the colony, the immunity had become more marked. In 1871 there were 329,597 Victorian-born persons in the colony, almost all of whom must have been under 20, the total number under that age being 363,332. No doubt the proportion of native-born was even greater among those at the younger ages, and among these the improvement in 1871 was most marked. When the populations in and outside of Melbourne are taken separately, as in Table VII., it appears that among the children living in the districts outside of Melbourne, the number of deaths from phthisis in 1871 was so small that it might almost be described as showing a total immunity.

It must be allowed that 1871 happened to be a year showing a rate of mortality below the average, whilst in 1861 it was above the average. The difference was not so great as to explain the lowness of the rate among young persons in 1871 ; but for the purpose of eliminating, if possible, the accidental variations, caused by the smallness of the numbers when any single year is taken, Table IV. was constructed, showing the average number of deaths per annum at different ages, at two periods of five years each. It was assumed,

that by making the census year the middle one of the five in each case, it would be allowable to take the population in these census years as the average of each five, and the rate per 10,000 was struck on this assumption. The result is to confirm in the main points the conclusions obtained from a comparison of the single years. In particular it appears that the rate among persons under 15, in the second period 1869-73, is only between one-half and one-third of that in the first, 1859-63. There is also the same increase during the second period between the ages of 20 and 35, which is to be explained in part by the influx of phthisical persons from other countries, and also by the fact, that in the latter part of 1861 and in 1862-63 there was a large emigration of adult males, especially to New Zealand, the numbers leaving being so great as to raise the total emigration from 21,689 in 1860, to its highest figures of 38,203 in 1862, with a sudden falling back to about the average amount of 21,779 in 1864. The effect of such a withdrawal of adults, occurring chiefly after the middle of the period, of course was, to make the average population in these classes really lower than that of the census year 1861, and so leading to the striking of a rate which is too low. If correction could be made for these disturbing elements, there can scarcely be a doubt that the rate for adults for 1859-63 would, to say the least, have been more equal to that for 1869-73.

On the whole it is fair to state that a comparison of the death-rate from phthisis at different periods shows a great improvement as regards children, due almost certainly to a comparative immunity on the part of the native-born, and about an equality among those above 20 years of age. It is easy to show, as has been done, that in successive years there is a larger proportion of native-born persons among those dying of phthisis, but a mere list of that sort is value-less for the purpose of proving a growing tendency to phthisical disease, unless it can be shown that the increase is greater than the increase of native-born persons in the population. This cannot be the case, since the mortality among young persons, who are now almost all native-born, has diminished. As they advance into the ages above 20, at which the disease becomes most fatal, they must more rapidly constitute a larger element in the lists of deaths from consumption. It certainly speaks well for the vigour of the Victorian-born portion of the population, that in 1871 only 72 deaths from phthisis, out of a total of 841, occurred amongst them, whilst they formed 329,597 out of a total population of 731,528.

The conclusions derived from this report are :—

1st. The mortality from phthisis in Victoria is little more than half of that in England.

2nd. The rate of mortality from phthisis in Victoria has been perceptibly less of late years.

3rd. That rate is especially low among persons under 15 or 20 years of age, and has been very greatly reduced between 1861 and 1871.

4th. The reduction of the mortality among young persons is to be explained by a comparative immunity among those born in the colony.

5th. The apparent increase of mortality among young adults is due to the influx of phthisical persons from abroad.

6th. The uniformity in the rate of mortality over the whole colony for a good many years, is owing to certain insanitary conditions operating especially in Melbourne, since for the rest of the colony the rate was reduced by about one-third between 1861 and 1871.

T. M. Girdlestone, F.R.C.S.
John Singleton, M.D.
John Williams, M.D.
James Jamieson, M.D.

TABLE I.

Showing the annual rate of mortality per 10,000 of population in England and Wales and in Victoria from Diseases of the Respiratory System and from Phthisis, at different periods.

	England and Wales.		Victoria.	
	1860—64.	1870—74.	1860—64.	1870—74.
Resp. System -	34·09	36·14	15·90	14·82
Phthisis - -	25·66	22·83	13·08	12·60

TABLE II.

Showing number of persons living and of deaths from Phthisis at different ages in England and Victoria.

Ages.	Persons Living.			Deaths from Phthisis.		
	England.	Victoria.		England.	Victoria.	
	1871.	1861.	1871.	1871.	1861.	1871.
Under 5 years	3,071.276	91,514	116,688	2,554	32	20
5 to 10 ,,	2,706,526	53,265	106,503	1,022	9	6
10 ,, 15 ,,	2,424,239	34,535	85,585	1,670	15	8
15 ,, 20 ,,	2,180,412	33,117	54,556	5,229	27	42
20 ,, 25 ,,	2,004,760	56,147	49,422	7,285	71	84
25 ,, 35 ,,	3,340,572	150,381	111,627	13,808	307	248
35 ,, 45 ,,	2,571,155	76,316	114,851	10,282	182	230
45 ,, 55 ,,	1,997,730	30,820	58,559	6,598	77	128
Above 55 ,,	2,415,596	14,227	33,737	4,928	33	75
	22,712,266	540,322	731,528	53,376	753	841

TABLE III.

Showing mortality from Phthisis per 10,000 of population at different ages in England and Victoria.

Ages.	England.	Victoria.	
	1871.	1861.	1871.
Under 5 years	8·31	3·50	1·71
5 to 10 „	3·77	1·68	·56
10 „ 15 „	6·88	4·34	·93
15 „ 20 „	23·98	8·15	7·69
20 „ 25 „	33·33	12·64	16·99
25 „ 35 „	41·33	20·41	21·32
35 „ 45 „	39·98	23·84	20·02
45 „ 55 „	33·02	24·98	21·85
Above 55 „	20·40	23·19	22·23
At all ages -	23·50	13·93	11·49

TABLE IV.

Showing average number of deaths and rate of mortality from Phthisis in Victoria at different ages, for two periods of 5 years each.

Ages.	Deaths from Phthisis.		Rate per 10,000.	
	Average 1859—63.	Average 1869—73.	Average 1859—63.	Averaoe 1869—73.
Under 5 years	33$\frac{3}{5}$	15$\frac{2}{5}$	3·67	1·32
5 to 10 „	7$\frac{4}{5}$	7$\frac{1}{5}$	1·46	·67
10 „ 15 „	11	11	3·18	1·28
15 „ 20 „	36	51$\frac{1}{5}$	10·87	9·38
20 „ 25 „	87$\frac{3}{5}$	93$\frac{1}{5}$	15·60	18·86
25 „ 35 „	274$\frac{3}{5}$	254$\frac{1}{5}$	18·26	22·77
Above 35 „	261$\frac{4}{5}$	455	21·57	21·96
At all ages -	712·4	887·2	13·18	12·12

TABLE V.

Showing number of persons living in Melbourne and Suburbs and in the rest of the Colony at different ages, in 1861 and 1871.

Ages.	Melbourne and Suburbs.		Rest of Victoria.	
	1861.	1871.	1861.	1871.
Under 5 years	24,243	30,204	67,271	86,484
5 to 10 „	15,592	27,849	37,673	78,654
10 „ 15 „	11,370	24,060	23,165	61,525
15 „ 20 „	10,345	17,650	22,772	36,906
20 „ 25 „	13,590	17,476	42,557	31,946
25 „ 35 „	32,688	33,098	117,693	78,529
Above 35 „	32,088	56,443	89,275	150,704
At all ages -	139,916	206,780	400,406	524,748

TABLE VI.

Showing number of deaths from Phthisis in Melbourne and Suburbs and in the rest of the Colony, at different ages, in 1861 and 1871.

Ages.	Melbourne and Suburbs.		Rest of Victoria.	
	1861.	1871.	1861.	1871.
Under 5 years	14	12	18	8
5 to 10 „	4	2	5	4
10 „ 15 „	9	6	6	2
15 „ 20 „	15	23	12	19
20 „ 25 „	39	52	32	32
25 „ 35 „	130	138	177	110
Above 35 „	122	228	170	205
At all ages -	333	461	420	380

TABLE VII.

Showing mortality from Phthisis per 10,000 of population in Melbourne and Suburbs and in the rest of the Colony, at different ages, in 1861 and 1871.

Ages.	Melbourne and Suburbs.		Rest of Victoria.	
	1861.	1871.	1861.	1871.
Under 5 years	5·77	3·97	2·67	·92
5 to 10 „	2·56	·71	1·32	·50
10 „ 15 „	7·91	2·49	2·59	·32
15 „ 20 „	14·49	13·03	5·26	5·14
20 „ 25 „	28·69	29·18	7·51	10·01
25 „ 35 „	39·76	41·69	15·03	14·38
Above 35 „	38·02	40·39	19·04	13·60
At all ages -	23·79	22·29	10·48	7·24

STILLWELL AND KNIGHT, PRINTERS, MELBOURNE.

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NOTES

ON

CASES OF TUMOUR IN THE MEDIASTINUM.

BY

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Reprinted from the "MEDICAL MIRROR," *March*, 1865.

LONDON:

PRINTED BY M'GOWAN & DANKS, 16 GREAT WINDMILL STREET, HAYMARKET, W.

M'GOWAN AND DANKS,
GREAT WINDMILL STREET, HAYMARKET,
LONDON.

NOTES ON CASES

OF

TUMOUR IN THE MEDIASTINUM.

SEVERAL examples of this interesting and somewhat rare affection having fallen under my notice during the last few years, I propose in this communication to give some of their details.

In a brief but most interesting paper published by my friend and late colleague, Dr. Budd,* these mediastinal growths are classified under the heads of *Primary* and *Secondary* Thoracic Cancer. In some of the cases I shall mention, this division is, in the absence of a complete history, difficult to make, although I am inclined to the belief that in nearly all, if not in every case, the mediastinal growth was the primary disease, and the lungs or other viscera became subsequently involved.

Secondary cancerous tumours have no special tendency to produce inflammation in the neighbouring tissues, whereas primary cancer is very apt to set up inflammation in the contiguous parts. Thus, in many of the cases alluded to, the lungs became involved by the spreading of the disease, or by pressure upon their roots. The cases appear to show that, if the vessels are compressed, gangrene results; but inflammatory action is generally consequent on destruction of the nerves, just as division of the fifth nerve causes inflammatory destruction of the eye-ball. In the first instance of the disease that came under my notice, the most marked symptoms, and those which gave rise to the fatal results, were dependent on cancer of the lung.

CASE I.—J. R., a painter, æt. forty-one, admitted into King's College Hospital, in the spring of 1856, with cough, dyspnœa, and red currant-juice-like expectoration. Percussion over the lower lobe of the right lung was dull, and here there was no vocal vibration. There was a swelling about the ninth and tenth intercostal spaces, very tender to the touch.

There was much difficulty of swallowing, and very marked

* "Transactions of the Medico-Chirurgical Society, 1859," p. 215.

pulsation of the dilated veins of the neck. The percussion note was wooden over the manubrium sterni, at the right side, and here the breathing was bronchial in character.

The patient died greatly emaciated. A tumour was found, at the post-mortem examination, encircling the aortic arch (which doubtless communicated the pulsation to the veins of the neck); the tumour extended upwards and downwards by the side of the trachea. The lymphatics of the neck were greatly enlarged.

In the lower part of the right lung was another tumour, which had pressed upon and made a concavity on the upper surface of the liver. The lung itself was a mass of cancer, partly solid and partly broken down into creamy juice.

This patient did not come under observation till a very advanced period of disease—long after the lung had become involved in secondary deposit—and the nature of the disease could not be doubted. In the following case, however, the patient was first admitted before any lung-symptoms had become developed.

The observation of this case gave rise to the paper already alluded to by Dr. Budd, in which some details are given; but from my own note-book I cull these additional facts, which bear upon some points shortly to be noticed.

Case II.—A healthy young compositor, finding that his face became livid and that he got very giddy when he exerted himself, applied for admission at King's College Hospital. The face and neck began to swell, and the swelling increased so much on lying down, that he was forced to sleep in an arm-chair; the veins of the neck became large and tortuous, and he suffered for days together from difficulty of swallowing. Nothing abnormal could be detected in the chest on percussion or auscultation, but a suspicion of aneurism or tumour, compressing the vena cava descendens, was hinted at. The symptoms became mitigated under the use of iodide of potassium. A month later, however, the dyspnœa returned, the face became bloated, voice husky, and a loud clanging cough, with streaky, puriform expectoration, occurred.

On percussion, dulness was now detected, to the right of the middle line of the sternum, but there was no thrill or pulsation. Paroxysms of spasmodic dyspnœa became frequent, and the patient died in a fit of delirium.

A tumour was found in the mediastinum, embracing all the structures at the root of the lung. On microscopical examination the stroma was found to consist of elonga[illegible]ucleated fibre-cells, some multicaudate, the interspaces b[illegible]ghtly packed with aggregated cancer-cells, the appearances being similar to

those which I have since observed in two or three of the other cases to be described.

A very similar case has been detailed by Dr. R. Bennett,* in which the intra-thoracic growth involved the same parts. It occurred in a female, æt. forty-eight. In this case the left pleura was full of fluid, and the lung œdematous.

Case III.—C. H., æt. forty-four, a cabinet-maker, applied to me, in July last, as an out-patient, at the Hospital for Chest Diseases, at Brompton. For several weeks he had suffered from shortness of breath on exertion, which gradually increased till he became unable to walk more than a few steps without resting. When first seen he had some cough and expectoration; his voice was feeble, speech and deglutition difficult; the face was suffused, eyes prominent, throat and neck puffy and œdematous, the external, jugular, and other veins at the root of the neck being large and full, the patient having the appearance of a strangled person. The left radial pulse was more feeble than the right. Percussion was very dull over the whole sternum; here tracheal breath-sounds were audible, and the sounds of the heart were also very distinct, as high as the root of the neck, but there was no murmur, abnormal cardiac sound, impulse, or thrill. Posteriorly there was loud tracheal breathing over the five upper dorsal vertebræ, and here an unusually dull sound was elicited on deep percussion. The breathing was hurried and shallow, and the respiratory murmur, mixed with sonorous *râles*, was heard feebly all over the chest, less air appearing to enter the left than the right lung.

It was at once evident that the mediastinum was occupied by a tumour, compressing the trachea, œsophagus, and superior cava, and also interfering with the circulation in the left arm. From the absence of cardiac murmur, thrill, or pulsation, there seemed no reason to believe that aneurism existed, nor was it thought probable that the tumour could be of a strumous character, as the patient was a healthy man, without a scrofulous family history. The diagnosis of carcinomatous mediastinal tumour was at once made, and a very unfavourable prognosis given. The patient declined to enter the hospital, although urged to do so. Under the influence of an active purge of aloes and senna, repeated daily, the breathing became more easy, the difficulty of swallowing lessened, and the puffiness of the face and neck subsided.

When next seen, a week after his first visit, there was, however, no material change in the symptoms or physical signs. Iodide of potassium was now ordered in free doses, and counter-irritation to the chest.

The cough increased rapidly, the expectoration became sanguineous, and the patient died a few days after his second visit.

A post-mortem examination was performed by the House-Physician of King's College Hospital, and a tumour, as large as two fists, occupying the position indicated during life by the post-sternal dulness, extending upwards on either side of the trachea, as high as the cricoid cartilage, downwards to the pericardium and the roots of the lungs, especially the left, and involving the large vessels in one mass, which was bounded posteriorly by the compressed œsophagus and vertical column. The tumour was irregularly lobulated, of a white colour, like brain-tissue, but of much harder consistence, exuding milky juice on section. It involved the superior cava, the innominate and azygos veins, the innominate artery, as well as the carotid and subclavian of the left side, and the whole aortic arch. The pneumogastric and recurrent laryngeal nerves passed through the mass, but did not appear to be compressed or flattened. The pulmonary artery vein and bronchus were embraced by the tumour; several large bronchial glands, containing softened tissue, were scattered about. The left carotid, with the pneumogastric and sympathetic nerves, were imbedded in a prolongation of the tumour, which extended as high as the fourth cervical vertebra.

The pericardium contained a few ounces, and the left pleura a few pints, of serum. There was no lymph or other evidence of pleurisy, save a slight adhesion at the right apex. No disease was detected in the lungs or in any other organ. The abdomen was not examined.

On microscopic examination the tumour was found to consist of fibrous tissue, from which exuded aggregated granules, free nuclei, fat globules, and irregularly-formed cells, resembling pus-globules, contrasting remarkably with the tubercular matter contained in a softened bronchial gland, which consisted of irregularly-formed granular corpuscles, all of the same size, whereas the cells contained in the cancerous mass varied from mere granules to two or three times the size of pus-corpuscles.

It is not very usual to find so many of the characteristic symptoms co-existing, and the diagnosis can seldom be made so rapidly and confidently as in this case; for, besides the very marked physical signs already detailed, all these general symptoms pointed to the existence of mediastinal disease.

Gradually increasing dyspnœa; clanging laryngeal cough; feeble voice; speech and deglutition difficult; face suffused, eyes red and prominent; throat and neck puffy and œdematous; jugular, axillary, and mammary veins congested; left radial pulse smaller than right.

Case IV.—A few months since a thin, pallid boy, æt. seven-

teen, applied as an out-patient at the Hospital for Consumption and Diseases of the Chest, at Brompton, suffering from shortness of breath. He had been ill three weeks.

On examining the chest, the right side, which moved very little even on deep inspiration, was bulging and prominent. The intercostal depressions were obliterated; the bulging was most marked anteriorly, in the mammary and infra-mammary regions; there was some redness of skin, and enlarged veins ramified tortuously over the chest and abdomen; several enlarged glands were visible in the pectoral and axillary regions. On percussion the whole side was dull, from the clavicle to three inches below the costal cartilages, at which point the edge of the liver could be felt, the dulness extending to the left side of the sternum. The percussion note was not absolutely dull behind, above the angle of the scapula, where vesicular breathing could be heard on auscultation; in front, however, and in the axilla no normal breath-sound could be heard; but a distant bronchial breathing was detected beneath the clavicle and all over the most prominent portion of the chest. No vocal thrill or vibration could be detected anywhere on this side. The apex of the heart was felt beating three inches below and three inches to the outer side of the nipple, where a very distinct systolic murmur was detected.

My colleague, Dr. Cotton, who examined the patient with me, inclined to the opinion that this unusual combination of symptoms arose from the presence of a malignant growth in the chest. As the boy could not be at once admitted into the Brompton Hospital, he was sent to King's College Hospital, where he was taken in under the care of Dr. G. Johnson, who, after some consideration, introduced a grooved needle between the fourth and fifth ribs, an inch external to the right nipple, and drew off fifty-six ounces of serum. The prominence remained as before, but the chest became tympanitic on percussion, with splashing and marked succussion sounds; the dyspnœa continued urgent; pulse, 120; respiration, 32. The lips became blue and feet œdematous. After a few days there was some flattening beneath the clavicle, and the circumference of the chest, which, on admission, was as follows :—

On level of nipple, right side, 16 inches; left, 14½ inches;
became „ „ 15 „ „ 15 „

The tympanitic resonance gradually diminished, and the dulness, which had remained absolute in the sternal region, extended more to the right side; here the bronchial breathing, which ceased on the removal of the fluid, was replaced by loudly-conducted heart-sounds. The dyspnœa and blueness of face varied from day to day, but six weeks after the operation the patient became drowsy and died comatose.

At the post-mortem much serum was found in both pleuræ, but no lymph or evidence of inflammation in either. In the anterior mediastinum was a hard white mass, the size of a fist, attached to the upper surface of the diaphragm, surrounding the trachea and root of the lungs, slightly adherent to the sternum and costal cartilages. The parietal layer of the pleura was thickened by a deposit of the same material, and the right lung was small, compressed, and adherent to the chest-wall behind. The mitral valve was slightly roughened, and the liver depressed from its natural position.

I cannot pass from this case, the diagnosis of which gave rise to much difference of opinion, without making a remark or two.

When first seen I was led to fancy, from the sallowness of skin and enlargement of veins, that the disease might be one of the liver, especially as I had watched a case of hydatid of the liver which produced a precisely similar bulging of the right side of the chest, but the limitation of the dulness to the right side and the respiratory sound heard over the tumour dispelled this idea; while the absence of history of sudden fever, with pain in the side, the bronchial breathing heard over the projecting part of the chest, the extreme enlargement of the side, which could hardly have arisen from empyæma without previous pneumothorax, the absence of fluctuation in the bulged intercostal space, and the unnatural distinctness of the transmitted heart-sounds, rendered the diagnosis of simple pleuritic effusion impossible. The insidiousness of onset, unyielding solidity, adherence of the reddened skin to the parts beneath, obstruction of veins, enlargement of glands, bronchial character of respiration, and, lastly, the fact that the mother of the lad was suffering from tumour, led to the conclusion that the disease must be of a carcinomatous nature. But the rarity of such disease, especially in very young subjects, and the rapid growth of so extensive a mass, made the diagnosis a doubtful one; and it was partly with a view to ascertain what was the real state of the case that a grooved needle was introduced, with the result already described.

The removal of the fluid, however, did not clear up all difficulty. That the simple effusion of serum should lead to such bulging of the chest was difficult to conceive; moreover, the bulging did not lessen on the escape of all the fluid (56 oz.) that could be evacuated.

I must confess that at this time, and until the death of the patient, I was at a loss to account for the symptoms. Had the following case fallen previously under my notice, I might have at least surmised the real nature of the disease:—

A. B—— was admitted into King's College Hospital with all the signs of pleuritic effusion, but without any history of an

acute attack. The disease did not yield to treatment, and the patient, who had been throughout in a miserable state of debility, died from asthenia.

At the post-mortem the right pleura was found full of clear serum; the lung, compressed and hobnailed, about the size of a pine-apple, occupying the pre-vertebral groove. The whole front of the chest was lined by a mass of solid tissue, varying from half an inch to two inches in thickness, covering the pericardium and extending laterally on either side of the sternum.

A somewhat similar case has been recorded by Dr. Barker ("Transactions of Pathological Society," vol. vii., p. 47), in which, besides a lobulated growth in the upper part of the mediastinum, a second flattened mass was attached to the whole anterior surface of the pericardium. In this case also the right lung was collapsed and nodulated, the pleura being full of turbid fluid. Cases of this kind make an impression on one's memory, and greatly lessen the difficulty of diagnosis in analogous cases that may fall under observation.

In the "Dublin Medical Press" for October 12th, 1864, a case is detailed in which the heart was displaced to the left in consequence of effusion into the right pleura. A loud systolic murmur occurred at the apex, which disappeared on the removal of the fluid by paracentesis. In this case a trace of thickening in the mitral valve, insufficient to account for the murmur, was observed. In the case I have fully detailed the roughening of the valve was very slight; but as the murmur was persistent and not influenced by the withdrawal of the pleuritic fluid, we must infer that the roughening was the cause of the murmur, especially as murmurs at the mitral valve, caused by displacement, are very rare. Dr. Benson, of Dublin, considers his case unique.

In both these instances the right lung was greatly compressed, not so much, however, as in the case of a patient at the Brompton Hospital, whose post-mortem I recently attended, in which the lung was not larger than the forefinger, and could scarcely be detected as it lay covered with condensed pleural tissue in the pre-vertebral groove. In this case the heart was pulled over to the right side and pulsated beneath the right nipple. The whole left side in the precordial region was resonant on percussion, and the anterior edge of the left lung extended beneath the right clavicle and occupied the space vacated by the upper lobe of the right lung.

A case occurred at King's College Hospital, recorded in the "Pathological Transactions," vol. x., p. 62, in which a cancerous tumour, occupying the interval between the œsophagus and trachea, projected into the latter so as to narrow the canal, and

communicated by an ulcerated opening with the œsophagus. In this case the difficulty of breathing was so great, that tracheotomy was contemplated, and I urged immediate recourse to the operation; but in the absence of the physician under whose care the patient had been admitted, this was postponed, and death occurred in a paroxysm of dyspnœa.

A similar case is recorded in the same volume of the "Transactions," in which life was prolonged and much suffering removed by this operation.

About the same time another case fell under my notice, also in King's College Hospital, of which I have preserved notes; and as this has never been published, I will give a few details :—

Thos. Gale, æt. forty-five, was admitted under the care of Dr. Budd, in December, 1858, with inability to swallow either solid or liquid food. The dysphagia had existed for twelve months; a probang had been occasionally passed and always met with an obstruction opposite the thryoid cartilage. At the time of admission the obstruction was almost complete, and the patient wasted rapidly from want of food, everything swallowed being coughed up or regurgitated a minute or two after it was taken. After some persevering efforts, Mr. Fergusson succeeded in passing the tube of the stomach-pump beyond the constriction, but no food was injected as had been at first suggested. An attempt was made to keep the patient alive by means of nutritive enemata, but without success, and the patient rapidly sank. At the post-mortem examination the bifurcation of the trachea was found to be imbedded in a mass of hard cancerous material, which involved also the arch of the aorta and the œsophagus, and was adherent behind to the pre-vertebral aponeurosis in front of the fifth and sixth cervical vertebræ. This carcinomatous tumour was of a rounded outline, but sent prolongations into the interspaces between the right and left bronchi, between the aorta and trachea, and between the trachea and œsophagus. The tumour was about three and a half inches in length, and extended from the third ring of the trachea to an inch below the bifurcation. The apparent size of the mass was increased by numerous large bronchial glands filled with pigment. The free surface of the tumour was smooth, but slightly nodulated. On the left side a deep groove existed, formed by the transverse portion of the aortic arch. The tissue at the root of the lung was hard, white, and glistening. Opposite the cricoid cartilage the œsophagus was found contracted so as scarcely to allow the passage of the forefinger, and on a level with the fifth tracheal ring it was constricted to the size of a crowquill. Below the first constriction the mucous membrane was eroded, and the channel widened into a large, almost gangrenous cavity, common to the trachea and œsophagus. From this cavity the right and

left bronchi diverged, and the trachea opened into it at its eighth ring; the eroded tracheal cartilages projected into the cavity; the surrounding parts were of scirrhous hardness, composed of fibrous tissue and degenerated epithelial *débris.* Many of the compound cells of which the mass consisted were multinuclear; others contained a good deal of oil and granular matter. The stroma consisted chiefly of yellow fibrous tissue.

The channel of emergence of the œsophagus was surrounded by a thick cartilaginous ring of carcinomatous tissue, but below this point the gullet was quite healthy.

A most interesting instance of this disease fell under my notice a few months ago. The patient was a German Professor, under the care of my colleague, Dr. Pollock. The tumour, from being quite imperceptible, grew while the patient was under observation, until it projected considerably through the sternum and intercostal spaces, and by its inward pressure gave origin also to a variety of symptoms similar to those observed in the other cases. This was the only instance I have seen in which the projecting tumour became inflamed on the surface, and, by involving all the neighbouring skin and subcutaneous structures, assumed all the characters of external cancer,

A case has been put on record by Mr. T. Holmes (*vide* "Pathological Transactions," vol. iv., p. 29), in which an encephaloid tumour of the mediastinum projected at the right side of the sternum; it pulsated strongly, and a systolic murmur was audible over the tumour and at the base of the heart, and gave rise to a suspicion of aneurism.

The following case was looked upon, when under treatment at King's College Hospital in 1858, as an instance of aortic aneurism, but when admitted into Guy's, a few months later, it was considered to be a case of mediastinal carcinoma. I will relate the symptoms, which I think will tell their own tale :—

G. J——, æt. thirty-four, a stone-mason, felt, while sawing stone, a sudden pricking pain below the right nipple, which was much aggravated by coughing. The face and arm became puffed and œdematous, and the superficial veins of the neck and chest turgid; after six weeks a swelling was noticed. The upper part of the sternum and the right costal cartilages became protruded, forming a prominence four inches in vertical and two in lateral measurement. Here percussion was dull and pulsation distinct. Two sounds were audible over the tumour similar to those over the aortic valves, but louder. There was no bellows-murmur; pulse at both wrists equal; respiratory-murmur feeble over right lung, throughout, with slight wheezing behind; breathing tracheal over upper dorsal spines. Rest in bed was enjoined, full diet without stimulants, and chloric ether

with paregoric to quiet the cough. The aching at the shoulder lessened, the tumour became less prominent, and after three weeks the patient returned to work, though he had much cough and dyspnœa, with occasional difficulty of swallowing and sanguinolent expectoration.

In January, 1859 (three weeks afterwards), the superficial epigastric and infra-mammary veins were very large, tortuous, and freely inosculating. No pulsation was appreciable in the tumour, but an impulse was to be felt through it, and the two sounds of the heart were to be heard with the stethoscope. The dulness on percussion extended from the sternal notch three inches in a vertical and three in a transverse direction. Breath sounds almost equal in the two lungs. Right radial pulse slightly stronger than left; apex of the heart beating three inches below the nipple, between the seventh and eighth ribs.

About a month afterwards, this patient was admitted into another metropolitan hospital, where, in the absence of history, the case was very naturally regarded as one of mediastinal tumour, probably cancerous. There can, however, I think, be little doubt that it was really an aneurism of the thoracic aorta undergoing spontaneous cure.

I cannot leave this case without remarking that rest in bed, so as to avoid all exertion, with simple unstimulating food, is followed not unfrequently by marked improvement in cases of aneurism, and that our prognosis should not be invariably hopeless. Most of us have met with one or two instances in which undoubted aneurisms have ceased to extend, and then gradually undergone contraction, and this without any very special medication. Lymph is poured out by the aneurismal sac; and if, from the quietness of the circulation, it has once an opportunity of becoming fully organized, it may withstand the full expansile influence of the blood-current.

In September, 1863, a patient died in the Brompton Hospital, thought to have a tumour in the mediastinum of a cancerous character. Paroxysms of dyspnœa occurred on exertion, and there was rhonchus all over the chest, with a loud clanging cough. The heart sounds were feeble, and there was no murmur, pulsation, dulness, or dysphagia, nor any history of rheumatism or of a blow on the chest. The autopsy showed an enormous dilatation of the arch of the aorta pressing against the sternum, trachea, and recurrent laryngeal nerves. The lungs were emphysematous at the edges.

A case the exact converse of this is detailed in Dr. Fuller's work "On Diseases of the Heart and Large Vessels," in which a mediastinal cancer gave rise to a prominent pulsating swelling on the side of the sternum, with a rough systolic murmur heard

over the dull portion of the chest both in front and behind. Although there was no dyspnœa, ringing cough, hæmoptysis, dysphagia, or other general symptoms, or history of aneurism, the physical signs were implicitly relied upon, which, with the exception of the absence of expansile character in the pulsation, seemed those of aortic dilatation.

The consideration of the three cases just detailed leads one to attach importance, in forming a diagnosis between aneurism and other tumours of the mediastinum, to the character of the pulse, which is less often unequal in the two radials in cancer than in aneurism. The same may be said of diversity in the size of the pupils. Pain, usually persistent in aneurism, is generally absent in cancer; enlargement of the superficial veins and œdema of the face, neck, and upper extremities is more usual in cancer; for aneurismal tumours, which are soft and yielding, do not usually create such obstruction in the veins as to render necessary the establishment of a collateral venous circulation. Malignant growths invade equally all the tissues in which they are formed, and thus cause constriction or closure of the large veins; for the same reason, and in the same manner, the circulation and nutrition of the lungs is impaired, and cancerous consolidation or even gangrene of the pulmonary tissue results.

If the tumour projects visibly from the chest, the left side of the sternum is somewhat the most usual seat, whereas aneurism is more common on the right. Pulsation, if it occur at all in cancer, is transmitted, not expansile in character, and the dulness on percussion is extensive in proportion to the extent of pulsation.

Not unfrequently, too, as has been shown, adhesion of the diseased lung to the pleura occurs with or without effusion. The pleura often becomes greatly thickened by morbid deposit, and the pericardium is occasionally thickened in the same way.

If any murmur is audible over a mediastinal cancer, it is similar in character to that heard at the base of the heart, and the cases described show that it is not unusual to hear loud tracheal breathing over the morbid growth.

In the diagnosis between these two conditions, however, the previous history and aspect of the patient often afford very valuable, if not conclusive data.

Aneurism affects the middle-aged; cancer, the young or the old. The first is often sudden in its origin, and the wheezing cough, aphonia, dyspnœa, or dysphagia vary with change of posture, and recur at intervals as the disease advances, whereas the pressure-signs of cancer are progressive, never retrogressive.

I should have been glad if space would have allowed me to

have alluded to several cases of aneurism, two of them now under treatment, which bear in an instructive way on the subject of this communication. Two cases of periosteal swelling upon the sternum, simulating aneurism or mediastinal disease, have lately been under my care. In one of these, the paroxysmal dyspnœa, combined with a prominent growth on the left side of the manubrium sterni, led to a suspicion of aneurism; but the projection rapidly disappeared under iodide of potassium and iodine ointment. In the second case, the node suppurated. In both, the disease was of syphilitic origin.

THE END.

LONDON: M'GOWAN AND DANKS, GREAT WINDMILL STREET, HAYMARKET.